Wind Chill

- On a cold, windy day the effects of wind chill tell us that it feels much colder than it really is.
- Troops run the risk of frostbite or even hypothermia:
  - Rapid, progressive mental and physical collapse that accompanies the lowering of human body temperature
- We forecast wind chill temperatures for all locations (***to include higher elevations***)
- Our desired lead time for a wind chill AWA is 6 hours

Formula for Wind Chill

- The formula to calculate a Celsius wind chill using V as the wind speed in kilometers per hour and T in degrees Celsius is:

- T(wc) = 0.045(5.27V**0.5 + 10.45 - 0.28V) (T - 33) + 33

- Note: In both formulas, ** means the following term is an exponent (i.e. 10**(0.5) means 10 to the 0.5 power, or the square root of V), - means to subtract, + means to add. The standard rules of algebra apply.

- Note: When wind speeds are below 4 mph., the above formulas will give you a wind chill that is higher than the actual temperature. When wind velocities are near zero and you are standing still, your body heat warms the air near your body. This warm air near your body provides some insulation from the colder environment. As a result, it may actually feel warmer than the actual temperature.

Wind Chill Factor

- High winds, in below-freezing air, can remove heat from exposed skin so quickly that the skin may freeze and discolor.

- In cold weather, wet skin can be a factor
  - A cold rainy day often feels colder than a "dry" one because water on exposed skin conducts heat away from the body better than air does.

- Hypothermia can occur with dry bulb temps above $0^{\circ}C$

Wind Chill

- Consider:

  ➢ Pressure gradient (wind speed)

  ➢ Temperature

Wind Speed (knots)	40	35	30	25	20	15	10	05	00	-05	-10	-15	-20	-25	-30
5	36	30	25	19	14	08	03	-02	-08	-13	-19	-24	-30	-35	-40
10	26	20	13	07	01	-06	-12	-18	-25	-31	-37	-44	-50	-56	-63
15	20	13	06	-01	-07	-14	-21	-28	-35	-42	-49	-56	-63	-70	-77
20	16	09	02	-06	-13	-20	-28	-35	-42	-50	-57	-64	-72	-79	-86
25	13	06	-02	-09	-17	-25	-32	-40	-47	-55	-63	-70	-78	-85	-93
30	11	04	-04	-12	-20	-28	-35	-43	-51	-59	-66	-74	-82	-90	-98
35	10	02	-06	-14	-22	-30	-37	-45	-53	-61	-69	-77	-85	-93	-101
40	09	01	-07	-15	-23	-31	-39	-47	-55	-63	-71	-79	-87	-95	-103

Forecasting Wind Chill

- Forecast surface winds using one of the following ROT's/methods:
  - ➤925mb winds X .60 - .80%
  - ➤Measure pressure gradient (5$_o$ Rule)
  - ➤3 isobar rule
  - ➤Trajectory bulletin
  - ➤MM5

Forecasting Wind Chill

- Forecast minimum temperature using one of the following ROT's/methods:
  - ➤925mb thermal pattern/lapse rate
  - ➤Advection technique
  - ➤Td at max heating
  - ➤Skew-T (06Z sounding)
  - ➤Dynagrads
  - ➤MM5/Meteograms

Forecasting Wind Chill

- Apply forecasted winds and temp to wind chill chart
- Be sensitive to locations/sites at higher elevations (RKSJ, RKNF, RKNR)
- Locations that typically verify your AWA:
  - ➢ RKSV, RKSJ, RKNF, RKNR